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**PART K**  
**FLOOR OPENINGS, WALL OPENINGS AND STAIRWAYS**

**WAC 296-155-500 Definitions applicable to this part.**

**“Floor hole”** means an opening measuring less than 12 inches but more than 1 inch in its least dimension in any floor, roof, or platform through which materials but not persons may fall, such as a belt hole, pipe opening, or slot opening.

**“Floor opening”** means an opening measuring 12 inches or more in its least dimension in any floor, roof, or platform, through which persons may fall.

**“Handrail”** means a rail used to provide employees with a handhold for support.

**“Low pitched roof”** means a roof having a slope less than or equal to four in twelve.

**“Mechanical equipment”** means all motor or human propelled wheeled equipment except for wheelbarrows, mopcars, robotic thermoplastic welders and robotic crimpers.

**“Nose, nosing”** means that portion of a tread projecting beyond the face of the riser immediately below.

**“Platform”** means a walking/working surface for persons, elevated above the surrounding floor or ground, such as a balcony or platform for the operation of machinery and equipment.

**“Riser height”** means the vertical distance from the top of a tread to the top of the next higher tread or platform/landing or the distance from the top of a platform/landing to the top of the next higher tread or platform/landing.

**“Roof”** means the exterior surface on the top of a building. This does not include floors which, because a building has not been completely built, temporarily become the top surface of a building.

**“Roofing work”** means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.

**“Runway”** means a passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

**“Safety monitoring system”** means a safety system in which a competent person monitors the safety of all employees in a roofing crew, and warns them when it appears to the monitor that they are unaware of the hazard or are acting in an unsafe manner. The competent person must be on the same roof and within visual distance of the employees, and must be close enough to verbally communicate with the employees.

**“Stair platform”** means an extended step or landing breaking a continuous run of stairs.

**“Stairrail system”** means a vertical barrier erected along the unprotected sides and edges of a stairway to prevent employees from falling to lower levels. The top surface of a stairrail system may also be a "handrail."

**“Stairs, stairways”** means a series of steps leading from one level or floor to another, or leading to platforms, pits, boiler rooms, crossovers, or around machinery, tanks, and other equipment that are used more or less continuously or routinely by employees or only occasionally by specific individuals. For the purpose of this part, a series of steps and landings having three or more rises constitutes stairs or stairway.

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**“Standard railing”** means a vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of persons.

**“Standard strength and construction”** means any construction of railings, covers, or other guards that meets the requirements of this part.

**“Toeboard”** means a vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent falls of materials.

**“Tread depth”** means the horizontal distance from front to back of tread (excluding nosing, if any).

**“Unprotected side or edge”** means any side or edge of a roof perimeter where there is no wall three feet (.9 meters) or more in height.

**“Wall opening”** means an opening at least 30 inches high and 18 inches wide, in any wall or partition, through which persons may fall, such as an opening for a window, a yard arm doorway or chute opening.

**“Work area”** means that portion of a roof where roofing work is being performed.

[Statutory Authority: Chapter 49.17 RCW. 96-24-051, (Order 96-05), § 296-155-500, filed 11/27/96, effective 02/01/97. 95-10-016, § 296-155-500, filed 4/25/95, effective 10/1/95; 91-24-017 (Order 91-07), § 296-155-500, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-500, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-500, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-500, filed 6/17/81; Order 74-26, § 296-155-500, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-505 Guardrails, handrails and covers.**

- (1) General provisions. This part applies to temporary or emergency conditions where there is danger of employees or materials falling through floor, roof, or wall openings, or from stairways, runways, ramps, open sided floors, open sides of structures, bridges, or other open sided walking or working surfaces.
- (2) The employer shall determine if the walking/working surfaces on which its employees are to work have the strength and structural integrity to support employees safely. Employees shall be allowed to work on those surfaces only when the surfaces have the requisite strength and structural integrity.
- (3) When guardrails or covers required by this section must be temporarily removed to perform a specific task, the area shall be constantly attended by a monitor to warn others of the hazard or shall be protected by a movable barrier.
- (4) Guarding of floor openings and floor holes.
  - (a) Floor openings shall be guarded by a standard railing and toe boards or cover, as specified in subsections (4)(g) and (7) of this section. In general, the railing shall be provided on all exposed sides, except at entrances to stairways. All vehicle service pits shall have a cover or removable type standard guardrail. When not in use, pits shall be covered or guarded. Where vehicle service pits are to be used again immediately, and the service person is within a 50 foot distance of the unguarded pit and also within line of sight of the unguarded pit, the cover or guardrail need not be replaced between uses. Where vehicle service pits are used frequently, the perimeters of the pits shall be delineated by high visibility, luminescent, skid resistant paint. Such painted delineation shall be kept clean and free of extraneous materials.
  - (b) Ladderway floor openings or platforms shall be guarded by standard railings with standard toe boards on all exposed sides, except at entrance to opening, with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.

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- (c) Hatchways and chute floor openings shall be guarded by one of the following:
    - (i) Hinged covers of standard strength and construction and a standard railing with only one exposed side. When the opening is not in use, the cover shall be closed or the exposed side shall be guarded at both top and intermediate positions by removable standard railings;
    - (ii) A removable standard railing with toe board on not more than two sides of the opening and fixed standard railings with toe boards on all other exposed sides. The removable railing shall be kept in place when the opening is not in use and shall be hinged or otherwise mounted so as to be conveniently replaceable.
  - (d) Wherever there is danger of falling through a skylight opening, and the skylight itself is not capable of sustaining the weight of a two hundred pound person with a safety factor of four, standard guardrails shall be provided on all exposed sides or the skylight shall be covered in accordance with (g) of this subsection.
  - (e) Pits and trap door floor openings shall be guarded by floor opening covers of standard strength and construction. While the cover is not in place, the pit or trap openings shall be protected on all exposed sides by removable standard railings.
  - (f) Manhole floor openings shall be guarded by standard covers which need not be hinged in place. While the cover is not in place, the manhole opening shall be protected by standard railings.
  - (g) All floor opening or hole covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).
    - (i) All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.
    - (ii) All covers shall be color coded or they shall be marked with the word "hole" or "cover" to provide warning of the hazard.
    - (iii) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.
  - (h) Floor holes, into which persons can accidentally walk, shall be guarded by either a standard railing with standard toe board on all exposed sides, or a floor hole cover of standard strength and construction that is secured against accidental displacement. While the cover is not in place, the floor hole shall be protected by a standard railing.
- (5) Guarding of wall openings.
- (a) Wall openings, from which there is a drop of more than 4 feet, and the bottom of the opening is less than 3 feet above the working surface, shall be guarded as follows:
    - (i) When the height and placement of the opening in relation to the working surface is such that either a standard rail or intermediate rail will effectively reduce the danger of falling, one or both shall be provided;

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- (ii) The bottom of a wall opening, which is less than 4 inches above the working surface, regardless of width, shall be protected by a standard toe board or an enclosing screen either of solid construction or as specified in subsection (7)(f)(ii) of this section.
  - (b) An extension platform, outside a wall opening, onto which materials can be hoisted for handling shall have standard guardrails on all exposed sides or equivalent. One side of an extension platform may have removable railings in order to facilitate handling materials.
  - (c) When a chute is attached to an opening, the provisions of (a) of this subsection shall apply, except that a toe board is not required.
- (6) Guarding of open sided surfaces.
- (a) Every open sided floor, platform or surface four feet or more above adjacent floor or ground level shall be guarded by a standard railing, or the equivalent, as specified in subsection (7)(a) of this section, on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a standard toe board wherever, beneath the open sides, persons can pass, or there is moving machinery, or there is equipment with which falling materials could create a hazard.
  - (b) Runways shall be guarded by a standard railing, or the equivalent, as specified in subsection (7) of this section, on all open sides, 4 feet or more above the floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toe board shall also be provided on each exposed side.
  - (c) Runways used exclusively for special purposes may have the railing on one side omitted where operating conditions necessitate such omission, providing the falling hazard is minimized by using a runway not less than 18 inches wide.
  - (d) Where employees entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding shall be provided.
  - (e) Regardless of height, open sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, and similar hazards, shall be guarded with a standard railing and toe board.
  - (f) Open sides of gardens, patios, recreation areas and similar areas located on roofs of buildings or structures shall be guarded by permanent standard railings or the equivalent. Where a planting area has been constructed adjacent to the open sides of the roof and the planting area is raised above the normal walking surface of the roof area, the open side of the planting area shall also be protected with standard railings or the equivalent.
- (7) Standard specifications.
- (a) A standard railing shall consist of top rail, intermediate rail, toe board, and posts, and shall have a vertical height of 42 inches (1.1m) plus or minus 3 inches (8cm)(39-45) inches from upper surface of top rail to floor, platform, runway, or ramp level. When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this subsection. The intermediate rail shall be halfway between the top rail and the floor, platform, runway, or ramp. The ends of the rails shall not overhang the terminal posts except where such overhang does not constitute a projection hazard.

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*Note: When employers are using stilts, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the height of the stilts.*

- (b) Minimum requirements for standard railings under various types of construction are specified in the following items:
  - (i) For wood railings, the posts shall be of at least 2 inch by 4 inch stock spaced not to exceed 8 feet; the top rail shall be of at least 2 inch by 4 inch stock and each length of lumber shall be smooth surfaced throughout the length of the railing. The intermediate rail shall be of at least 1 inch by 6 inch stock.
  - (ii) For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal OD diameter with posts spaced not more than 8 feet on centers.
  - (iii) For structural steel railings, posts and top and intermediate rails shall be of 2 inch by 2 inch by 3/8 inch angles or other metal shapes of equivalent bending strength, with posts spaced not more than 8 feet on centers.
  - (iv) For wire rope railings, the top and intermediate railings shall be at least 1/2 inch fibre core rope, or the equivalent to meet strength factor and deflection of (b)(v) of this subsection. Posts shall be spaced not more than 8 feet on centers. The rope shall be stretched taut, so as to present a minimum deflection.
  - (v) The anchoring of posts and framing of members for railings of all types shall be of such construction that the completed structure shall be capable of withstanding a load of at least 200 pounds applied in any direction at any point on the top rail, with a minimum of deflection.
  - (vi) Railings receiving heavy stresses from employees trucking or handling materials shall be provided additional strength by the use of heavier stock, closer spacing of posts, bracing, or by other means.
  - (vii) Other types, sizes, and arrangements of railing construction are acceptable, provided they meet the following conditions:
    - (A) A smooth surfaced top rail at a height above floor, platform, runway, or ramp level of between 39 inches and 45 inches;
    - (B) When the 200-pound (890N) test load specified in subsection (6)(b)(v) of this section is applied in a downward direction, the top edge of the guardrail shall not deflect to a height less than 39 inches (1.0m) above the walking/working level. Guardrail system components selected and constructed in accordance with this part will be deemed to meet this requirement.
    - (C) Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail;
    - (D) Elimination of overhang of rail ends unless such overhang does not constitute a hazard.
- (c) (i) A standard toe board shall be 4 inches minimum in vertical height from its top edge to the level of the floor, platform, runway, or ramp. It shall be securely fastened in place and have not more than 1/4 inch clearance above floor level. It may be made of any substantial material, either solid, or with openings not over 1 inch in greatest dimension.

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- (ii) Where material is piled to such height that a standard toe board does not provide protection, paneling, or screening from floor to intermediate rail or to top rail shall be provided.
- (d) Floor opening covers shall be of any material that meets the following strength requirements:
  - (i) Conduits, trenches, and manhole covers and their supports, when located in roadways, and vehicular aisles shall be designed to carry a truck rear axle load of at least 2 times the maximum intended load;
  - (ii) All floor opening covers shall be capable of supporting the maximum potential load but never less than two hundred pounds (with a safety factor of four).
    - (A) All covers shall be secured when installed so as to prevent accidental displacement by the wind, equipment, or employees.
    - (B) All covers shall be color coded or they shall be marked with the word “hole” or “cover” to provide warning of the hazard..
    - (C) If it becomes necessary to remove the cover, a monitor shall remain at the opening until the cover is replaced. The monitor shall advise persons entering the area of the hazard, shall prevent exposure to the fall hazard and shall perform no other duties.
- (e) Skylight openings that create a falling hazard shall be guarded with a standard railing, or covered in accordance with (d)(ii) of this subsection.
- (f) Wall opening protection shall meet the following requirements:
  - (i) Barriers shall be of such construction and mounting that, when in place at the opening, the barrier is capable of withstanding a load of at least 200 pounds applied in any direction (except upward), with a minimum of deflection at any point on the top rail or corresponding member.
  - (ii) Screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied horizontally at any point on the near side of the screen. They may be of solid construction of grill work with openings not more than 8 inches long, or of slat work with openings not more than 4 inches wide with length unrestricted.

[Statutory Authority: RCW 49.17.010, .040, .050. 00-14-058 (Order 99-43), § 296-155-505, filed 07/03/2000, effective 10/01/00. Statutory Authority: Chapter 49.17 RCW. 96-24-051, (Order 96-05), § 296-155-505, filed 11/27/96, effective 02/01/97. 95-10-016, § 296-155-505, filed 4/25/95, effective 10/1/95; 94-15-096 (Order 94-07), § 296-155-505, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-505, filed 11/22/91, effective 12/24/91; 91-03-044 (Order 90-18), § 296-155-505, filed 1/10/91, effective 2/12/91; 90-03-029 (Order 89-20), § 296-155-505, filed 1/11/90, effective 2/26/90. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-505, filed 1/21/86. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-13-053 (Order 81-9), § 296-155-505, filed 6/17/81; Order 76-29, § 296-155-505, filed 9/30/76; Order 74-26, § 296-155-505, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-50503 Roofing brackets.**

- (1) Roofing brackets shall be constructed to fit the pitch of the roof.
- (2) Securing: Brackets shall be secured in place by nailing in addition to the pointed metal projections. When it is impractical to nail brackets, rope supports shall be used. When rope supports are used, they shall consist of first grade manila of at least 3/4 inch diameter, or equivalent.

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- (3) Crawling boards or chicken ladders.
- (a) Crawling boards shall be not less than ten inches wide and one inch thick, having cleats 1 x 1 1/2 inches.
    - (i) The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed twenty-four inches.
    - (ii) Nails shall be driven through and clinched on the underside.
    - (iii) The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.
  - (b) A firmly fastened lifeline of at least 3/4 inch diameter rope, or equivalent, shall be strung beside each crawling board for a handhold.
  - (c) Crawling boards shall be secured to the roof by means of adequate ridge hooks or other effective means.

[Statutory Authority: Chapter 49.17 RCW. 96-24-051, (Order 96-05), § 296-155-50503, filed 11/27/96, effective 02/01/97. 95-10-016, § 296-155-50503, filed 4/25/95, effective 10/1/95; 91-03-044 (Order 90-18), § 296-155-50503, filed 1/10/91, effective 2/12/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-50503, filed 1/21/86.]

**WAC 296-155-50505 Reserved.**

[Statutory Authority: Chapter 49.17 RCW. 94-15-096 (Order 94-07), § 296-155-50505, filed 7/20/94, effective 9/20/94; 91-24-017 (Order 91-07), § 296-155-50505, filed 11/22/91, effective 12/24/91. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-50505, filed 1/21/86.]

**WAC 296-155-510 Reserved.**

[Statutory Authority: Chapter 49.17 RCW. 91-24-017 (Order 91-07), § 296-155-510, filed 11/22/91, effective 12/24/91; 89-11-035 (Order 89-03), § 296-155-510, filed 5/15/89, effective 6/30/89. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-510, filed 1/21/86; Order 74-26, § 296-155-510, filed 5/7/74, effective 6/6/74.]

**WAC 296-155-515 Ramps, runways, and inclined walkways.**

- (1) Width. Ramps, runways and inclined walkways shall be eighteen inches or more wide.
- (2) Standard railings. Ramps, runways and inclined walkways shall be provided with standard railings when located four feet or more above ground or floor level.
- (3) Ramp specifications. Ramps, runways and walkways shall not be inclined more than twenty degrees from horizontal and when inclined shall be cleated or otherwise treated to prevent a slipping hazard on the walking surface.

[Statutory Authority: Chapter 49.17 RCW. 96-24-051, (Order 96-05), § 296-155-515, filed 11/27/96, effective 02/01/97. 95-10-016, § 296-155-515, filed 4/25/95, effective 10/1/95. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-515, filed 1/21/86.]